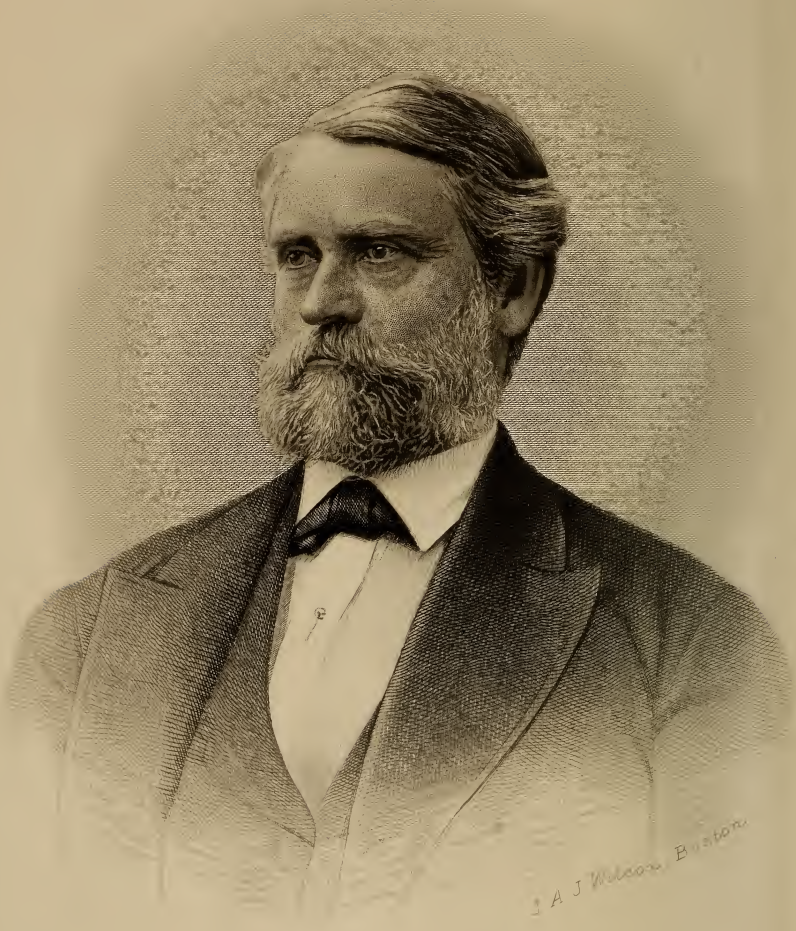
ETHAN SAMUEL CHAPIN

A Memorial

1814–1889



F. S. Chopin

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"*He likes nothing better than to do kind acts in a quiet way.*"

"*When will we learn that with all true men it is not what they intend to do, but it is what the qualities of their natures bind them to do, that determines their career?*"

"*Life is neither a pleasure nor a pain; it is a serious business, to be entered on with courage, and in a spirit of self-sacrifice.*"

"*New occasions teach new duties,*
Time makes ancient good uncouth.
They must upward still, and onward,
Who would keep abreast of truth."

PREFATORY NOTE.

The story of every man, who has successfully risen to a position of usefulness or eminence, ought to be told. Such accounts encourage those who are themselves struggling upwards, and also lead any who have already succeeded to stretch out the helping hand to others who are still in the thick of the fight. The following simple record of a self-made man could in no way better carry out his aim in life, than by serving either of these two purposes.

Unfortunately, Mr. Chapin's correspondence has not been preserved, and, consequently, this sketch lacks the charm which is always felt when one tells his own story.

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ETHAN SAMUEL CHAPIN.

ETHAN SAMUEL CHAPIN, the son of Samuel Chapin, Jr., and of Mary Pease, was born at Somers, Conn., on the 14th of July, 1814. He was a direct descendant in the seventh generation of Deacon Samuel Chapin, one of the earliest settlers of Springfield, Mass., who came to this city with his family in 1642, and who, after serving as magistrate and in other important offices, died here in 1675. The bronze statue representing a Puritan settler of New England, which stands in Stearns Park, was erected as a memorial to this Deacon Samuel Chapin. He was one of the committee that laid out the towns of Northampton and Hadley, which, with Springfield as the shire town, were formed into the county of Hampshire in 1662. The descendants of this Deacon Chapin have been, like himself, "useful and highly esteemed" men. Samuel Chapin, Sr., the grandfather of Mr. Ethan Chapin, died in 1833, at the age of

Birth.

Ancestry.

ninety-one. He had served as an ensign during the Revolutionary War, and in consequence was always called "Ensign Chapin." Also, Mr. Ethan Chapin's maternal grandfather, Stephen Pease, was an officer in the War for Independence, and was present at the battle of Stillwater, and at the surrender of Burgoyne. Thus, on both his father's and his mother's side, Mr. Ethan Chapin came of honorable and Revolutionary stock.

Father's failure.

Some time before his death Samuel Chapin, Sr., just mentioned, mortgaged his farm at Somers. His son, Samuel Chapin, Jr., who took charge of it at too high a valuation, soon found himself seriously involved, and had to give up the entire estate.

The gentle spirit of Mr. Chapin was almost overwhelmed by this sore calamity. He was sustained and the family character preserved chiefly by the Christian courage of his strong-minded wife, Mrs. Mary Pease Chapin.

At this time Ethan was but nine years old. There were then eight children in the family, and it became necessary in the changed circumstances to make, without delay, new plans for each one. The older children had already received a fair common-school education, and consequently were at once able to do some-

thing for themselves. The misfortune fell most heavily upon Ethan, who was sent to live with his grandfather, Stephen Pease. Although he was allowed to attend school a part of the time for three years, he was given no school-books, and was therefore unable to make any satisfactory progress in his studies. His school-days practically ended when he was but nine years old, — an age at which, in those days, most boys had hardly begun to study.

Effect on Ethan's prospects.

Early in his teens this young lad went out to begin the hard battle of life for himself. Removed from the restraints of home life, without friends to guide or to help him, and without the ballast which a good common-school education gives, he began working in a weaving establishment at Chicopee Falls, then called Cabotville. He experienced all the disadvantages of extreme poverty, often went to bed hungry, and suffered cold for lack of sufficient clothing. Like many another high-spirited young man, he often felt much ashamed of his very humble lot. These experiences, however, were by no means an unmixed evil. He learned in this hard school those habits of patience, industry, economy, and self-reliance which in time made of him a strong man.

Begins to seek his own fortune.

"Honor and shame from no condition rise;
Act well thy part, there all the honor lies."

Boyhood traits.

Ethan was never fond of play, and even while a boy joined but little in the sports of the children of his own age. Nor was he fond of farming. Being a farmer's son, and living during his boyhood on a farm, he had to do his share of the lighter chores, and later on of the harder labor, but his heart was never in this kind of work.

While the other boys were playing, he was trying to make something with whatever tools he might find. Before he was ten years of age, he had made a little water-wheel, which he successfully set up in a stream that ran near to his father's house; and not long after, he devised and made, without a suggestion from any one, a number of fairly good locks. He was unusually mature, and delighted in poring over books, in thinking out some novel theory for explaining what he saw about him in nature, and in making new things with his own hands. One day, hearing his uncle, who was a teacher and an intelligent man, speak of the sun's drawing up water, he immediately corrected the statement, and proceeded to describe, in a thorough and exact way, the scientific theory of evaporation.

Ethan, therefore, left his grandfather's farm as soon as possible, and went to work, in a factory as a bobbin boy. The operatives began work before sunrise, as soon as there was light enough to see, and labored *fourteen and a half hours a day!* Beginning so early in the day, all went to the workshops before eating, and were allowed *twenty minutes* for breakfast! Those who were a trifle late were locked out! Mr. Chapin was one of three boys who worked together carrying bobbins. One of those companions, who is still living, and is now a prominent and successful man, in writing of those early days says: "Our duty was to draw bobbins, by means of a rope attached to a box divided into two compartments, one for the empty bobbins, the other to receive the full ones. I can hear the rattle of those old looms to-day, and see in imagination the three young boys dragging their boxes along, and the women scolding because we did not come sooner. I remember we got very tired every night. Ethan was a tall, slim boy, kind-hearted and good-natured. We were both poor boys, of course, and our earnings went to our parents. Very small they were, however."

Experiences in various factories.

The same friend, on first hearing of Mr.

Chapin's death, wrote, "Ethan Chapin was a Christian boy, and a great and good man."

From this establishment young Chapin went to work at the Ames Arms factory in Chicopee. Later he worked at Ruggles & Davis's gun-shop at Staffordville, and still later he returned to the Ames factory.

Mechanical tastes.

The five years from 1832 to 1836 were spent in these various manufactories. During this period he exhibited more and more a remarkable genius for mechanics. He soon learned to understand all the machinery in each of the establishments where he was employed. In addition to this, Ethan always took keen delight in planning means for improving any machine. He was constantly devising something new. His services as a designer of ornamentations for swords, scabbards, and the handles of guns and pistols, were highly prized. He was also very greatly valued for his skill in executing such designs with his own hands.

Receives a prize for his skill.

Although never taught the engraver's art, both his mind and his hand seemed to take naturally to it. The exigencies of his work led him frequently to design and to make new tools. With these improved instruments he was able to turn out

more and more delicate work. At one time, an especially fine design for a sword handle being desired, a prize was offered for the best. Mr. Chapin's was the one to which the prize was awarded. There are still in the possession of the family a number of similar articles made about this time by Mr. Chapin. Among them is a pistol, which was entirely of Mr. Chapin's own design and workmanship. It is seven inches long. The handle is made of the root of a maple-tree, which Mr. Chapin himself cut and fitted. On the steel are engraved very fine designs, representing a dog in the chase, and an eagle in flight. The pistol cannot, of course, compare with the weapons now turned out at the Springfield factories, but fifty or sixty years ago it was considered, and with reason, first-class work.

When Mr. Chapin left the Ames factory he was esteemed the most skillful workman in the establishment. While still less than nineteen he was made an overseer. Many a man much older than he was glad to receive suggestions from this modest and ingenious young man.

Studiousness.

While at the Ames factory, and before he was twenty years of age, young Chapin came into possession of a copy of

Comstock's Natural Philosophy, and afterwards of a book on Chemistry. These two books were fairly consumed, such enthusiasm and interest did they excite in his mind. They laid the foundation for all his future studies. He kept these books near by while at work, and read them as opportunity offered. For this studiousness he was frequently chided by the overseer. No exciting novels of Zola or Haggard ever stirred the feelings of a sentimental young man more than did these solid books the studious and thoughtful inclinations of Ethan S. Chapin.

Inventive genius.

Many interesting incidents of this early period of his life, which show the decided mechanical and scientific bent of his mind, are now told. At the Ames factory there was a man who attempted to invent a new kind of water-wheel. Knowing of Mr. Chapin's tastes and skill, he consulted him in regard to every minute thing, adding parts, and omitting or altering others, at his suggestion. The final success of the wheel was due to Mr. Chapin as much as to the inventor. In the factory at Staffordville there was a workman who tried to develop the theory of "perpetual motion," until Mr. Chapin convinced him that he was wrong, and that his theory was wholly

impracticable. While at the Ames gun factory Mr. Chapin invented, and made with his own hands, a gun-lock, which was sent on to Washington. This, for some unaccountable reason, was not patented. One very similar to it in construction has since been extensively used. In a book by Lieutenant J. A. Dahlgren, on "Naval Percussion Locks and Primers," printed at Philadelphia in 1853, there is given the following description of a gun-lock: —

Invents a gun-lock.

"The only apparatus of this kind (cannon percussion lock) that has come to our notice, which embodies a high degree of mechanical ingenuity with a probable fitness for the purpose of its creation, is a sample in this department, which was sent down from the Bureau among a parcel of rubbish; bearing no name, date, or other record of time, place, or inventor." Following this there is full description of the lock, and then the author goes on to say: "The description cannot do justice to the ingenuity of the contrivance, and to the excellence of the finish by which it is developed." This book of Lieutenant Dahlgren's fell into Mr. Chapin's hands. Reading the above paragraph and the description of the lock referred to, he immediately saw that the lock was the

one which he had invented and sent on to Washington years before. On the margin of the book, in his own handwriting, there is the following note: —

"E. S. Chapin's design for a lock, made about 1834, at the age of twenty."

Early experiments.

In order to aid him in his studies and experiments, he suspended in a barn, with the assistance of one of his brothers, a simple pendulum, whose movements he observed with very great care. He was greatly impressed when he noticed for the first time that such a pendulum not only swings back and forth, but also, while moving, completes a circle.

Subsequently, during the war, a gentleman who had invented a new rifle-shell, and who was passing through Springfield on his way to Washington, stopped at the Massasoit House. Hearing of Mr. Chapin's interest in such things, he showed him the shell, carefully describing it and the principles involved in its construction. The description had not yet been completed when Mr. Chapin said to the inventor: "This shell is useless. Instead of moving as you suppose, it will turn over and strike the object aimed at with the other end." These im-

promptu observations proved to be entirely correct.

The year 1836 marks an important change in Mr. Chapin's life. He had already gained success as a machinist. His occupation was more than congenial. It was one for which he had unusual fitness, and in which, without doubt, he would have become distinguished. His friends have often regretted that anything should have turned him away from this profession. In this feeling Mr. Chapin himself more or less shared.

Begins hotel-keeping.

His older brother, Mr. Marvin Chapin, had been living for some time in Westfield, but in 1836 bought the old Cabot House at Cabotville, and, needing help, sent for Ethan to join him in the new venture. Anxious to be of service to his brother, and aware that his eyes were being injured and even his health seriously undermined by his present occupation, Ethan immediately gave up his place at the Ames factory, and joined his brother in the care of the hotel. This sudden change of occupation was clearly providential, as it was unsought for, reminding us that "God is the master of the scenes. We must not choose which part we shall act. It concerns us only to be careful that we do it well."

At one time or another, all of the four brothers, Marvin, Ethan, Albert, and Horace, shared in the responsibilities of the Cabot House. For a time it was carried on by Ethan and Albert, but again came into the hands of the two who had begun with it in 1836 as the firm of Marvin & Ethan Chapin, and so remained until July, 1843, when they removed to Springfield.

The Chapin brothers.

The conduct of these brothers toward each other was exceedingly interesting. There was a spirit of family loyalty among them which was very unusual. Each one seemed to regard the other's interests as identical with his own. The fact that one of them was needed by another, in order to the success of some plan or business undertaking upon which either one of them had entered, was a sufficient reason for his giving up his personal enterprise in order to meet the needs of his brother. The results which these men have attained have been due, in no small measure, to the fact that they have thus stood by each other in every time of need. It was largely due to this same spirit that Mr. Ethan Chapin became a hotel-keeper and a business man, rather than a mechanic and an inventor.

Mr. Chapin lived for six years at the Cabot

House in Chicopee, and while living there he was married on the 22d of September, 1839, to Louisa Burns, the daughter of John Cogswell and Mary Marble Burns, of East Windsor, Conn., where she was born in February, 1814. They have had five children, — Amelia, the wife of the Hon. William Henry Haile; Henry Watson, who married Ellen A. Trask, and who died in 1870; Emma Frances, the wife of Mr. Henry S. Ward, of New York city; Anna Pauline, who died in infancy; and Alice Sophia, who was long an invalid, and who died in 1880.

Marries.

The building of the Boston and Albany Railroad through Springfield, in 1838, assured the future growth and importance of the city. Those who foresaw this growth and took advantage of it soon reaped the benefit of their wisdom. Previous to this date, Court Square had been the centre of the town, as it was the centre of business. All the leading taverns, such as The Exchange and the Hampden Coffee House, were in that vicinity.

Mr. Marvin Chapin's new undertaking.

In 1842 the Judge John Hooker property, standing south of the railroad and west of Main Street, was offered for sale. The property contained an acre and a half, and meas-

ured one hundred and eighty feet on Main Street. It was without question the best site in Springfield for a hotel which hoped to catch the growing railroad traffic. Foreseeing this, Mr. Marvin Chapin, in partnership with Mr. Israel M. Parsons, of Westfield, purchased it at auction for $8,000. The old house was moved back, and a contract was immediately made for the erection of a brick block, to be used as a hotel.

Although the original building was but one fifth the size of the present hotel, the whole undertaking was, for those times, a large one. Neither of the partners had money. The place had, therefore, to be mortgaged, in order that the purchase might be completed and the new building erected. It is not strange, under these circumstances, that Mr. Parsons became alarmed at the risks assumed in the enterprise, and withdrew. Again Mr. Marvin Chapin sent for his brother Ethan, who immmediately came and filled the gap. He bought out Mr. Parsons's interest in the partnership, and, forming with his brother the firm of M. & E. S. Chapin, started the well-known Massasoit House, which under their management has since been one of the most successful hotels of its kind in the country.

Mr. Ethan Chapin joins his brother.

THE MASSASOIT HOUSE.

While the construction of the new building was being pushed forward as rapidly as possible, various names, such as "The Massachusetts," "The Massasoit," and "The United States," were suggested for the proposed hotel. The first of these names was seriously considered, and would have been adopted but for the well-known unpopularity of a hotel of the same name in Boston. Before anything had yet been definitely settled by those most interested, two barbers, who had rented the basement room on the corner of Main and Railroad streets, afterwards occupied for years by Powers's well-known news-room, practically decided the question. They hung up their sign, and advertised in the "Springfield Republican" that they were ready to receive patrons at their new shop under the "Massasoit House." The friends of the Chapins were generally very much disappointed in this choice of a name, and remonstrated with them in regard to it. It was said that many could not spell or pronounce it; that it could not be remembered by those who had been pleased with the hotel on a first visit, and wished to come to it a second time; and that it was an odd and awkward name. Experience has shown that this unusual name helped to secure for the hotel its unusual

Naming the new hotel.

success. There have been all kinds of hotels, but only one "Massasoit House."

The Massasoit House.

The hotel was opened on the 27th of June, 1843. The first name registered on its books was that of Horace Mann. It was a first-class hotel at a time when such houses were rare. It was a pioneer, meeting the wants of the times, and hence its unique career.

The affairs of the Massasoit House were conducted by the two brothers, Marvin and Ethan, who constituted the firm, in a spirit of mutual helpfulness and harmony. Everything moved on with as little friction as if there had been one master mind, instead of two, at the head of the establishment. Each had his own distinct department, which he ordered wisely, and in such a way as to supplement his brother's work.

Mr. Marvin Chapin's department.

Mr. Marvin Chapin was a far-sighted financier. Naturally all the financial affairs of the firm were left to his careful hands. He first selected the site for and launched the enterprise which, under the united skill and efforts of the two brothers, grew to be one of the best-known hotels in the country.

The practical and general management of the Massasoit House was left in the hands of

the younger brother, who gave himself enthusiastically and patiently to the oversight of everything, great or small, connected with the establishment. The building has been enlarged three times, and each time all the plans were made, and all the details of building were carried out, under the careful oversight of Mr. Ethan Chapin. His inventive genius and mechanical skill were frequently put to use in improving the arrangements of the hotel. The laundry, the kitchen, the engine-room, and other parts of the building were fitted up with various devices of his own for lightening labor, saving expense, and for furthering the comfort both of the guests and of the employees. He was always on the lookout for new things, his mechanical skill enabling him to see with great shrewdness their probable utility. The Massasoit House was one of the first hotels to make use of steam for cooking. Mr. Chapin had thought of such a possibility in connection with his studies, and, finding that steam had already been tried elsewhere with success, immediately decided to introduce it into his own hotel.

Mr. Ethan Chapin's department.

On several occasions, finding the man in charge of the engine too ill to do his work, he immediately ordered him home, and sent

word to the office that he was occupied and could not be seen. Then, pulling on some overalls, he went to work in the midst of the oil, the steam, and the dirt of the engine-room with as much earnestness as if this were his regular employment, and his work was well done. There are few hotels whose proprietors either could or would have done this service. At another time, the engineer wished some additions to be made, which would involve a good deal of expense, but which, he claimed, would greatly improve the engine. The idea was entirely his own, and he confessed that it was an experiment, but so confident was he that it would succeed that he offered to pay the whole expense in case the experiment proved useless. He only asked permission to carry out his scheme, and to have the firm meet the expense in case it should succeed. On hearing this proposal, Mr. Chapin asked to have the new contrivance explained to him. He listened carefully, and saw that the engineer's ideas were good, and the carrying out of them quite feasible. He therefore authorized the expense, and refused to allow the poor workman to bear any of the responsibility, as the man had volunteered to do.

No pains nor expense were spared by the

proprietors of the Massasoit House to make it a first-class hotel. Mr. Chapin traveled far and near, visiting all the best hotels, and examining carefully into their management, in order to get suggestions for improving his own. The wants of every guest were carefully considered and, if possible, met. The manager of another hotel once came to Mr. Chapin to warn him about a certain young man who had come over to the Massasoit House from his hotel, adding, "You cannot afford to keep that boarder, he is so troublesome." The young man was then waiting for the dinner-gong to sound. On hearing it, he rushed to the dining-room, and, finding a dish of luscious peaches on one of the tables, he began looking them over for the purpose of selecting the best. Mr. Chapin quietly ordered the waiter to keep the young man well supplied with the best peaches in the house. At the other hotel he had found it necessary to be on hand early, in order to have his wants supplied. Observing that this was not required at the Massasoit House, he immediately changed his conduct, and made no further trouble while he remained in the house.

Enterprise.

Mr. Chapin's conduct toward all his associates and employees was wise as well as kind and

considerate. A young man, who was employed in the office, was once left in charge of everything for several days, during Mr. Chapin's absence on business. Taking advantage of the young man's extreme youth and inexperience, a colored porter, who had long been employed there and who was a useful man, was very impudent. This conduct was reported to Mr. Chapin on his return. He immediately called the porter, and, in the presence of the clerk, asked if the report of his conduct was true. The man admitted that it was. Mr. Chapin immediately paid him up in full, and then said that, although he was sorry to do so, he must dismiss him, as it would not do to allow the one who represented the proprietors to be treated as he had recently treated the clerk. The latter interceded for the delinquent, who promised to do better in the future, and was forgiven. Such a course as this, uniformly followed, made it always easy to control the affairs of the establishment.

Treatment of employees.

A poor man, who had been employed for several years in the Massasoit House, once came to Mr. Chapin, and, with a good deal of diffidence, said that he needed two hundred dollars that very day. Mr. Chapin immediately offered to lend him that amount, saying that he might

pay the debt at his convenience, and that he would never ask for the money, even if it were not paid, — a promise he faithfully kept, as the debt was not paid until after his death.

This same man, thinking that he could better himself, left the Massasoit House for a number of years, but being unsuccessful he returned to Springfield. Before securing employment both he and his wife fell seriously ill. Mr. Chapin, hearing of their condition, went to see them every day, supplied them with the best that the hotel could furnish, and even sent a nurse to care for them until they were well, when the man was again employed.

On one occasion the young clerk at the office fell ill, and his father came to take him home. He was persuaded not to do so that day. The next morning the young man asked his father if he were ready to take him home. The old gentleman replied: "I don't think you had better go. Mr. Chapin wants you so much that he says he would rather have you, with white kid gloves on and your hands tied behind your back, than any one else he knows; so I guess you had better stay here. Mr. Chapin will take good care of you." This shows how Mr. Chapin appreciated a man who was serving him well. The young man had

not known before how highly his services were valued.

Helpfulness to young men.

Remembering the disadvantages against which he, while a poor lad, had struggled, Mr. Chapin made it his business through life to encourage and help along worthy young men who were trying to better their condition. Even boys who had been employed as waiters were promoted from one situation to another, until many of them are now occupying important positions as useful men, to which they were aided by the kind man for whom they once worked.

On another occasion the storekeeper of a new shop, at which Mr. Chapin was making large purchases for the hotel, hearing the purchaser's name, asked, "Are you Mr. Ethan Chapin of the Massasoit House?" Being told that he was, he expressed much gratification, saying, "I would go a long distance to see the man who can make a millionaire out of a poor waiter-boy!" He had heard of a wealthy and successful business man, who was formerly a waiter at the Massasoit House, and who attributes his success in life largely to Mr. Chapin's influence.

One day a gentleman, who had dined at the hotel, called Mr. Chapin and introduced

him to his wife, who was with him, and said: "My wife has never known until to-day that I began life as a waiter here in the Massasoit House, but I wish her now to know the man who helped me to become what I am." There are a number of such men, who, stimulated by Mr. Chapin's example and helped along by his advice and encouragement, have become prominent and successful in various spheres of life.

Mr. Chapin's reticence.

Mr. Chapin, being a thoughtful and modest man, was also naturally reticent. This gave to those who did not know him the impression that he was unfeeling. One who afterwards came to understand him thoroughly says: "He was so exact, and at the same time so just, that I could hardly get over the feeling, which took possession of me when I first met him, of standing in fear of him. His observant faculties, however, were so keen that I think he realized what thoughts were passing through my mind, and he soon became very lenient and careful." There were many for whom Mr. Chapin had a very high regard who were quite ignorant of the fact. He was frequently heard to remark, when learning of the death of some friend or acquaintance, "He did not know how much I thought of him."

Treatment of soldiers.

The proprietors of the Massasoit House proved themselves to be, during the Civil War, among the most loyal of the citizens of Springfield. When the first Massachusetts troops passed through the city, the whole north end of the hotel was beautifully illuminated, and hot coffee with refreshments was distributed to the men. The same was done when the Second Regiment was in Springfield, on its way to the front. Later, when the veterans began to return, great attention was always paid to them. No one of them, whatever his circumstances, was allowed to go unserved. All this was well known, but what is not equally a matter of common report is the part which Ethan Chapin played in helping the negroes to escape in the dark and unsettled days before the war. On more than one occasion, with the knowledge of but few in the city, he concealed, either on his own premises or near by, parties of these negroes, whom he fed and cared for until arrangements were completed for sending them farther north.

Underground Railroad.

The Massasoit House was thus one of the stations of that "Underground Railroad" which safely conveyed hundreds of fugitives from the South to Canada and to freedom. Those were days when the

principles and the courage of anti-slavery men were put to the most severe test. Mr. Chapin was one of those men, all too rare, whose principles do not vary with circumstances.

Strict integrity.

Although the money matters connected with the hotel were largely in the hands of his brother, yet Mr. Ethan Chapin also was a very careful, shrewd, and successful business man. Of all his business qualities, his strict integrity was the crown. One who was intimately associated with him all his life says: "I trusted him implicitly in everything, and he never cheated me of a single cent. He never wanted anything that belonged to me, and never let me take what was his. He was perfectly true." Speaking of him in this same line, one of the leading ministers of Springfield said that the city owed a great deal to such men as Mr. Chapin, mentioning with him a number of others of the same stamp, especially the Merriam Brothers. He gave it as his opinion that, as the result of the decided and high moral stand taken by these men, certain kinds of business of doubtful character had never been introduced into Springfield and could not enter the city. Certainly this was high praise. The memory of the men who have left such a legacy to any place ought to be preserved with jealous care.

Although a quiet and unobtrusive man, Mr. Chapin's successful management of the Massasoit House was known to all. Naturally his advice came to be more and more sought. He was asked to become a director in several important companies, where it was felt that his advice and character would be of weight. At one time he was strongly urged to accept the presidency of one of the largest incorporated companies in Springfield. In this case it was proposed that he should also have the practical superintendence of the concern. There is little doubt but that Mr. Chapin would have been as successful in these lines of business as in that to which he had devoted himself, but he persistently refused to be drawn into any of them. It was only in later years, when he was giving up active work at the hotel, and that at the urgent advice of family and other friends, that he consented to become one of the directors of the Chapin Bank.

Mr. Chapin's business talent.

While unwilling to be turned aside from his chosen work to any other business, he was always interested in public affairs, and gladly bore his share in every scientific, philanthropic, and religious movement. When the Springfield City Library was organ-

The Springfield Public Library.

ized, in 1857, Mr. Chapin was one of those who took a practical and lively interest in it. The library was first opened in a room on Main Street, but was removed to quarters in the City Hall in 1860. The books at that time were both few and ill-kept. Those were the days of small things for an institution which has grown to be one of the ornaments of this prosperous city. The library, with its eighty thousand volumes, now ranks as the seventh in number of books, and the fifth in expenditure, among the public libraries of the United States, and is accommodated in a building well adapted to its purpose. In 1864, when a charter was first secured for the library, Mr. Chapin was one of the original incorporators. Later, in 1871, he was one of those whose generous gifts helped to the purchase of the present beautiful site and building. In every time of its need, Mr. Chapin took a very deep interest in the growth and success of the Public Library.

Other objects of interest.

The Springfield Hospital, the School for Christian Workers, and the French Protestant Church are some of the other enterprises to which he contributed, and for the success of which he earnestly hoped. Among the various objects to which he gave,

and of which most of his friends know nothing, is a most excellent institution in Ahmednagar, India, called "The Chapin Home." This home was begun in 1884, by Miss Sarah J. Hume, with funds given for the purpose by Mr. Chapin, as a memorial to his daughter Alice, who had died in 1880.

"The Chapin Home."

The object of "The Chapin Home" is one which appealed strongly to his feelings and to his judgment. This institution not only offers a home to worthy and needy women, but gives them an opportunity, as far as possible, to support themselves. The more ignorant are taught to read, while all receive instruction in sewing and cooking. Some have been taught to make buttons, and to do various kinds of useful needlework. The purpose of the institution is to help the poor to become self-supporting, a matter of the very highest importance in a country like India. The following notice of the home appeared a few years ago in one of the Bombay papers, from which the estimation in which it is held may be understood: —

"The Chapin Home, so called from a donor in the United States, is a modest institution which will escape the notice of the visitor unless specially inquired for, but which will

repay a visit, under the guidance of Miss Hume, through whose energy it exists. It has long been a problem to know what to do with the Hindu women who, desirous of becoming Christians, are set adrift by their friends, and those who, for other reasons, find themselves friendless and helpless, and apply for aid. Miss Hume has solved this problem by "establishing this home. All women who are admitted are taught to read and write, but special instruction is given in sewing, and in the cutting out and making of native garments. They form a staff of nurses, and are sent to help in the care of the sick, or go out for domestic work. For these services they receive money, and they will soon be able entirely to support themselves. All are required to study and work, so that the home is in no sense a poorhouse. At present there are ten inmates. One is a Brahmin widow. This home will give a hearty welcome to any widows who wish to learn to support themselves, and at the same time are willing to learn Christian truth."

Mr. Chapin an intelligent giver.

As in other things, so too, in the matter of giving, Mr. Chapin was not led by impulse. He acted on principle, and only after due deliberation. He gave systematically and generously to the various religious

objects, but he was often heard to say that, if he could give to but one object, that one should be *The American Sunday School Union.* His practical, business insight led him to feel that the surest and best returns come from efforts for the young.

Work for the "First Church."

Mr. Chapin very enthusiastically and generously gave his services to help on the business schemes of the churches with which he was identified. He was the efficient chairman of the committee which made the extensive repairs on the old First Church, when it was modernized, in 1863, by the removal of the old pulpit, the introduction of a large platform with a small desk, the cutting down of the pews, and by frescoing. It was the unanimous opinion of all that the alterations were very successfully made, and that the chief credit for this success was due to Mr. Chapin.

Connection with the "Memorial Church."

It was, however, especially in connection with the Memorial Church, which was organized in 1865, that Mr. Chapin showed himself an invaluable helper. This church was organized largely by men of enterprise, ability, and character, both from a religious and a worldly point of view. It did not pass, as many societies do, through a gradual process of evolution, from a weak society

with a precarious existence into a strong church. It was strong from the outset. In such a church and among such men it was that Mr. Chapin felt at home, and was appreciated. He was one of the incorporators of this church. At the first meeting of the parish he was the first member chosen on the building committee, a committee in which he was associated with such men as the late Dr. J. G. Holland, G. M. Atwater, Esq., and others. The contracts for building the church edifice were made by this committee, which had full charge of the entire work. Mr. Chapin was elected a member of the business committee of this church each year from 1872 to 1887. He was a member of the society's committee, which, with the committee of the church, was appointed to extend a call to the Rev. W. T. Eustis, who became the first pastor of the church. He was also on many other committees appointed from time to time for the consideration of various matters of importance. Thus for more than twenty years he stood as one of the pillars of this church of Christ, serving it in every possible way.

Mr. Chapin's relations with the various pastors whose ministry he enjoyed were of the most familiar kind. The testimony which they have given is exceedingly

Mr. Chapin as a parishioner.

interesting. In writing about him, one of them says: "He was a warm personal friend through all my ministry. I have a most delightful remembrance of all his genial qualities, in a personal intimacy and friendship extending over more than a quarter of a century. He was a man upon whom his pastor could rely in every emergency as true and trusty and wise."

Mr. Chapin as a friend.

Many, in a great variety of positions in life, can give similar witness to the faithfulness and the value of his friendship. Says one who was long in his employ in the Massasoit House, "I felt toward Mr. Chapin as toward no other man, not even my own father, he showed such an interest in me." Says another who was a lifelong friend: "His kind acts, which were constant, drew me to him as a boy, during the first years of our acquaintance, when hardly a word escaped his lips expressing his attachment to me. He influenced me more by his love for me and interest in me than any other man who has crossed my path. Although more than three years have passed since I last saw him, still I often see him in my dreams to this day. In fact I dreamed of him only last night."

Even strangers were impressed by those qualities which only his best friends fully un-

derstood. An Englishman, whom Mr. Chapin met in London in 1881, hearing of his death, writes: "I am sorry to think I shall not see the good man again. I never remember to have been so much impressed by a stranger as I was by him, and my wife felt the same, though she had the pleasure of seeing him but once." More than most men, he would welcome a friend at the busiest moments, would turn aside with unfailing kindness to listen to all kinds of appeals for aid, or to manifest the courtesy which was his habitual treatment of all who sought his presence.

"This matter of friendship is often regarded slightingly as a mere accessory of life, a happy chance if one falls into it, but not as entering into the substance of life. No mistake can be greater. It is the golden thread that ties the hearts of all the world."

His diffidence.

Mr. Chapin exceedingly disliked all ostentation, and even the appearance of putting himself forward. His natural courtesy, his simple tastes, and a diffidence which was caused by the consciousness of his lack of education, often made him silent and retiring where he was fitted to be a leader. In 1860, when the Rev. H. M. Parsons began his Bible service in the First Church, Mr.

Chapin, with many others, joined the pastor's class, but he did so after carefully stipulating that he should not be asked to answer any questions. Mr. Parsons promised not to call on him until he himself should choose to take part. This arrangement satisfied Mr. Chapin. The second Sabbath the lesson was on the miracle at Cana in Galilee, the turning of water into wine. While others were ventilating their views on the passage, Mr. Chapin's interest grew more and more intense, until finally he broke out with the remark, "Could not the Almighty condense all the forces of nature, which ordinarily act in more extended periods of time, so that in an instant the product was seen in the good wine?" The leader of the class assented, and then Mr. Chapin went on for five or ten minutes to the great edification of all in the class, speaking in simple language as he described the composition of the grape up to its ripeness and expression into wine. In his earnest desire to speak correctly and fluently, he would sometimes study the dictionary for hours, searching for suitable words with which to express his ideas.

Mr. Chapin was hearty and genial in his domestic life. His enjoyment of the home consisted largely in planning for the comfort

ETHAN CHAPIN'S RESIDENCE, SPRINGFIELD, MASS.

and improvement of each member of the family. The beautiful place on Chestnut Street, purchased in 1869, and occupied the following year, was thoroughly enjoyed by him, not chiefly because it was more comfortable and convenient than the suite at the Massasoit House, which previously had been their home, but because it was more truly a home, and was therefore a better place for the family. He took great pains in remodeling the house and in furnishing it, with the purpose of adapting everything to the best comfort of the household, studying to make each part suit the needs and tastes of the one who was to occupy that particular apartment. Many can testify to the genial and loving atmosphere which pervaded the place, the chief element of which was Mr. Chapin's unselfish spirit.

Mr. Chapin in his home.

Remembering with keen regret the misfortune under which he had labored while a boy, he spared no pains to save his children from all similar disadvantages. Their pleasure was his pleasure, and their profit his profit. He gave time to their recreations. They still remember his going out with them to skating parties simply because they enjoyed the fun. After strapping on their skates, he would stand or walk about in the cold until

Self-denial for his children.

it was time to return home, when he would patiently help the daughters to remove them. His enjoyment of their pleasure was so sincere that no impression of self-denial on his part was left on any one's mind. "To be full of goodness, full of cheerfulness, full of sympathy, full of helpful hope, causes a man to carry blessings of which he is himself as unconscious as a lamp is of its own shining."

It is not strange that the children were always glad to have the good father with them. On one occasion, while in New York on business, he spent a good deal of time running about to five different places in search of a particular kind of card-case, for which he had heard one of his daughters express a desire. In later years, after he had become a grandfather, he showed the same interest in the enjoyments of his grandchildren.

He was never so much absorbed with the cares of an exacting business that he could not find leisure to work and plan for his children's welfare. While giving them such opportunities as the best schools offered, he also sought to devise means for their physical and mental improvement. He gladly furnished them with good books, and tried to place before them true and high standards in everything.

The same spirit of helpfulness, and of delight in others' pleasure, was seen in the spirit manifested by him toward his parents, who spent their last years with their sons at the Massasoit House. No pains were spared to make them comfortable and happy. Members of the family remember with what earnestness he used, at family devotions, to pray for them: "As the light of their eyes grows dim, may they have light from above."

Thoughtfulness for parents.

Another expression often used by him in prayer was, "By the dispensations of thy providence, which thou so often bringest near to us, we are reminded that we, too, soon must die, and after that the judgment."

When any members of the family were away from home, he never failed to write long and valuable letters, full of wise counsel. It is a matter for sincere regret that these letters have not been preserved. Mr. Chapin was so sensitive in regard to their supposed literary defects, that he insisted that his children and friends who were the fortunate recipients of these communications should promise to destroy them. One who received many letters from Mr. Chapin says of them that they were the most tender and the most valuable letters he had ever received. Mind-

Correspondence.

ful of the promise which he had given, he carried them on his person for a time and then concealed them, and only after reading and re-reading them did he at last reluctantly destroy them. He says: "The very thought of those letters brings tears to my eyes. I wish I never had promised to destroy a single one of them."

Letter to a daughter.

Fortunately one letter has been preserved, and is given below. It was written on hearing the very welcome news that one of his children, while away from home, had become a Christian: —

SPRINGFIELD, *July*, 18—.

It was with unspeakable delight that I perused your kind and interesting letter, even weeping for joy. I knew that you were thoughtful, but did not think that you were so near to the kingdom of heaven. I am glad that you did not wait. Delays are dangerous. The Spirit will not always strive with man. Cast your burdened soul entirely on your compassionate Saviour. He is able, He is willing. Doubt no more. May your joy and rejoicing be great in His service on earth, and you be fitted to join in that endless song of praise! Your happiness will be greatly increased while on earth if you enjoy the smiles of your Sa-

viour. May God give you wisdom, and direct your thoughts, and lead you in green pastures and beside still waters, and make your rejoicing complete in his continual mercies, which are new every morning, fresh every evening, and repeated every moment of our lives. The step that you have taken will, in a great measure, ease the anxiety of mind that I had for you. Strong religious principles are needed to carry any one safely through this fallen world of sin and temptation. Give my kind regards to Miss B—— for her interest in your spiritual welfare. . . .

From your affectionate father, with pleasing recollections,

E. S. Chapin.

The daughter to whom this letter was addressed says: "My father wrote me very many and long letters when we were separated. In writing he always expressed himself well, and often in quite a poetical strain."

This testimony is confirmed by all with whom Mr. Chapin corresponded. His great modesty led him to underestimate the value of everything that he did. He set his standards high, and aimed at perfection in all things. This habit still further aggravated his con-

sciousness of any deficiency. On every point which implied a lack of education, Mr. Chapin was especially sensitive. He would even apologize for this to those with whom he happened to be in conversation. Says one who knew him well, and who regarded him as greatly his superior: "I used to feel humiliated when hearing him speak of his lack of an education, and often said to him: 'Mr. Chapin, it is not right for you to berate yourself as you do. No one else notices these things as you do. You expect too much of yourself.'"

Self-depreciation.

Mr. Chapin's natural tastes showed themselves very decidedly in the books which he chose both for himself and for his children. He never read anything trivial. He found no pleasure in the ordinary novels and stories which those about him devoured with the greatest avidity. "I have no time for such things," he used often to say, which meant simply that he did not think them worth reading. Had he regarded their contents valuable, he would have found all the time that was needed for reading them, and that with care. Works containing condensed thoughts and weighty principles were always attractive to him. Of other books he often

Choice of books.

remarked: "I don't like to wade through so much to get so little."

In addition to scientific works with which he was familiar, he valued histories, biographies, books of travel, and also standard poetry. "The Lady of the Lake" was a great favorite of his. Among his books there is a small, well-worn copy of this poem, which, like his Bible, was often carried about in his pocket, and was a much-prized companion. He would often quote from it, with enthusiasm, passages which he had memorized. How plainly this shows us the possible combination of the gentler with the stronger traits so beautifully blended in Mr. Chapin's character!

The scrap-book, to which he was constantly adding for the last thirty years of his life, is chiefly made up of scientific items and articles, of religious anecdotes, and of choice pieces of poetry. Such a scrap-book is often a fair indication of the character of the man who made it.

Enjoyment of fine scenery.

The tastes and characteristics developed by Mr. Chapin in literature manifested themselves whenever he traveled. While in Europe, which he twice visited, he sought first the museums, the art galleries, and the places famous for their beautiful scenery.

Those who accompanied him can never forget with what intense enjoyment he climbed the mountains in the Scottish Highlands, and looked down upon those charming lakes made famous by his favorite poet. When he crossed the grand old mountains of Switzerland, how he enjoyed to the full each new and beautiful landscape! Here he also gladly seized a long-coveted opportunity for studying the movement of glaciers, a subject on which he had independent ideas, and about which he wrote fully in his books. Later, when in Southern Italy, nothing could restrain him from climbing to the top of Mount Vesuvius, or from going to the very edge of the crater, in order that he might examine for himself this wonderful vent of the internal furnaces of the earth.

Observing faculty.

The various trips which he took, on our own continent, through Canada, up the St. Lawrence, down the Saguenay, and also in the West, down the Mississippi, and through the South, were equally enjoyed, while they were made very profitable, as he never failed to notice each object of interest, and to draw some lessons from it.

Visits to museums.

Much as he enjoyed all remarkable and historic scenes, he found himself chiefly attracted by the magnificent museums

in the large cities of Europe. During the last six weeks spent in Europe in 1881, he was in a hotel at South Kensington, very near to the South Kensington Museum. Day after day he visited the India Museum, the National Collection of Portraits, the Natural History Museum, or some other collection, never seeming to tire of studying them. The models of machinery and of boats, which he there discovered, furnished him with food for thought for a long time.

Each day, as he returned elated with these visits, he would talk most enthusiastically with those about him, describing the things which he had seen, pointing out the defects or the excellences of what had chiefly attracted his attention. In addition to the fact that he enjoyed these frequent visits to the museums, his object in it all was to increase his knowledge, especially in the line of his scientific studies. He often expressed regret that he was not able to go to England again, in order that he might once more visit the South Kensington Museum.

Renewed interest in scientific studies.

One day, when about forty years old, Mr. Chapin was shown a gyroscope. This greatly interested him, and he immediately purchased one. The more he thought about this wonderful little toy, the

more he felt his old love for study and investigation coming back to him. His scientific books were taken again from their shelves with the same zest as of old, and from that day may be dated the real beginning of his scientific work. The little gyroscope, which was the unexpected cause of this renewed study, has been treasured in the family as an heirloom. Mr. Chapin had already reached middle life when he fairly began those scientific studies, in the prosecution of which he showed himself to be a truly remarkable man. His attainments, in the face of obstacles which would have been insurmountable to most men, furnish us with a most impressive lesson. We find this man, who while a boy had received so meagre an education that he could not write correctly, nor express his thoughts even orally with any degree of freedom, after reaching middle life, and under the pressure of business which allowed him leisure only when others were asleep, prosecuting with enthusiasm and success the most abstruse and difficult scientific studies. In the light of such facts, one is almost tempted to say that a man may become whatever he chooses, irrespective of circumstances. It is certainly true that the most adverse circumstances cannot belittle one who is

Progress under difficulties.

inherently great or good. As Phillips Brooks, in his sermon on Lincoln, beautifully says: "The more we see of events, the less we come to believe in any fate or destiny except the destiny of character."

> "The heights by great men reached and kept
> Were not attained by sudden flight,
> But they, while their companions slept,
> Were toiling upward in the night."

Mr. Chapin early became convinced that gravitation determines the form, the condition, and the movements of the earth and of all the celestial bodies. With this idea for the central point, and applying it to a great variety of cases, he developed a most elaborate system. Many of his ideas were new, and even contrary to the established theories of scientists. His lack of education and limited opportunities for research made it necessary for him to go over ground which had been satisfactorily traversed by others. Thus time and strength were wasted by his failure to know the results of investigations previously made. On the other hand, this was not an unmixed evil, as he was free to adopt theories and to draw conclusions unhampered by what was commonly taught and believed. He made it a rule to accept no conclusions which he had

Importance of gravitation.

not proved to his own satisfaction. While thus traversing carefully ground which he felt that he had fairly tested, Mr. Chapin lost no opportunity for correcting his errors, for elaborating his theories, and for increasing his knowledge. He explained his theories with untiring care and earnestness to educated men who were guests at the hotel, or whom he met anywhere, asking them to point out any defects which they might discover, and to assist him to clearly state his ideas. There are many who can recall conversations held with Mr. Chapin which were centred mostly on his favorite theme. Whenever the listener failed in understanding the point under discussion, Mr. Chapin would attribute this to his own inability to express himself fluently and to make his meaning plain, referring with great regret to his consciousness of these deficiencies. It never seemed to occur to him that the listener could fail of having the capacity needed for understanding these abstruse subjects, if only he himself could properly state what was so evident to his own mind. So, too, he never entertained any doubt regarding the truthfulness and the value of his theories because they were not apprehended even by scholarly men. He had un-

Efforts to increase his knowledge.

Confidence in the soundness of his theories.

bounded confidence in every one of them, and had a firm belief that they would all, sooner or later, be accepted by scholars, and would prove to be of increasing value to the world. He realized that

> "Men exist for the sake of one another :
> Teach them or bear with them."

He felt deeply the importance of making known his theories, even if they brought him into opposition with commonly accepted scientific views. Those who advance new truths generally have to suffer for them. He fully believed, that "whoever hesitates to utter that which he thinks the highest truth, lest it should be too much in advance of the time, . . . must remember that, while he is a descendant of the past, he is a parent of the future; and that his thoughts are as children born to him which he may not carelessly let die."

Desire to make them known.

In 1864 Mr. Chapin published anonymously a pamphlet of twenty-six pages entitled "Gravity and Heat." The reception which this modest little work met encouraged him to prepare a larger one.

Early publications.

"Gravity in Nature," a volume of one hundred and twenty pages, was printed over his own name in 1867. The full title of this book

was, "The Correlation and Conservation of Gravitation and Heat, and Some of the Effects of these Forces on the Solar System."

The story of the preparation of these earlier works is truly romantic.

Aided by his daughter.

Feeling that it would be quite impossible for him to express his ideas in good English, or to do any of the literary work necessary for the production of a book, he began using his daughter, now Mrs. Haile, as an amanuensis and helper.

Previous to this, when not more than twelve years of age, she had spent much time in reading to him. In order to spare his eyes, which were giving him much trouble, he allowed her to read aloud even his scientific books. Mrs. Haile recalls reading much which was then quite incomprehensible to her.

At first it was necessary to explain his ideas over and over again before she could understand them sufficiently to state them plainly. As the work went on, of course, this became gradually easier. Laboring under such difficulties, the work progressed quite slowly, and parts had to be written and rewritten until whole pages were almost committed to memory by the amanuensis. Mr. Chapin greatly enjoyed the companionship of his daughter dur-

ing the progress of these literary labors, and appreciated her help. This appears in the appropriate dedication of his first book, in the preparation of which she had filled so important a part: —

"As a mark of parental esteem for her attainments, I dedicate these few pages to my daughter, my companion and assistant in thought and study, amid the cares and perplexities of a distracting business."

Professor Peirce's estimate of Mr. Chapin.

The publication of this book brought Mr. Chapin to the notice of the literary men of the country, who immediately recognized him as a unique man and a scholar. The late Professor Benjamin Peirce, of Harvard College, used to say that, if Mr. Chapin had been given the advantages of an early education, he would without doubt have become an authority in science. In recognition of his attainments, Williams College honored him with the degree of M. A. After an interval of twenty years, in 1887 Mr. Chapin gave to the world the latest fruits of his study and meditation in a volume with the appropriate title, "Gravitation the Determining Force." In the preparation of this book he had the very valuable assistance of the Rev. M. C. Stebbins, to whose hand the

Mr. Chapin's last book.

greatly improved literary cast of the book is largely due. This volume, like the former one, was dedicated to Mrs. Haile.

This book was beautifully printed at the Riverside Press. In the preface Mr. Chapin speaks of the very natural satisfaction which he felt because many points in his former work, which at the time of its publication were considered at variance with the current opinions of standard authors, had now been practically confirmed by conclusions, which had been reached by eminent scholars, and were now substantially in accord with his own views.

Mr. Chapin a religious man.

Mr. Chapin was a deeply religious man both in his beliefs and in his character. His scientific turn of mind showed itself here, as everywhere. It seemed impossible for him to believe that for which he could not find exact and full proof. The faith of such men, however, when once they have been wrought upon by the Spirit of God, is true and steadfast. This was the case with Mr. Chapin. His apprehension of truth was clear, and his religious views were well balanced. Even before conversion he was an unusually religious man. But for this, he could not have passed without contamination through the influences with which he was surrounded while a

young man. Temptations to which so many yield were nobly resisted, and resulted in making him a stronger and a better man. Mr. Chapin's views were strict in regard to the practice as well as in regard to the theory of religion. The inconsistencies and the unworthy lives of certain professing Christians, and the differences which are so often magnified to the hindrance of the Master's work, tried him more than they do most men.

He was a thorough believer in law, and knew that, in the spiritual as truly as in the natural world, all laws work out into appropriate results. Not more surely does the law of gravity, whose workings he had studied so diligently, lead every particle of matter on the earth to seek the centre of the globe, than does the law of the religion of Jesus Christ draw every one whom it has possessed toward Him and toward a holy life. This led him to hold a very high ideal of what the life of one who professed to be a follower of the meek and holy Jesus should be. For this reason he long postponed the making of a public profession of religion, although he had for years been leading a truly Christian life.

Law of the spiritual world.

While Mr. Chapin was still very young his sister Marcia died. She had long been

an invalid, suffering from consumption. During her illness she frequently called Ethan to her bedside, and talked with him on religious subjects. She made him promise to think of these things, and to try to be a good boy. These conversations made a great impression upon him, and this he never forgot. Many years after, he used to speak with great affection and reverence of this sister, who had so early led him to think seriously of these important matters. Later, when about eighteen years of age, he attended a series of special services. It was at this time that he experienced a change of heart. From that time on Ethan was always considered a Christian.

A sister's influence.

Conversion.

It is far too common for even Christians to forget that Jesus said to his disciples: "But I say unto you, Love your enemies, do good to them that hate you, and pray for them that despitefully use you." Mr. Chapin obeyed this command of his Master to a very unusual degree. He seldom showed the least resentment. He not only forgave those who had ill-treated him, but in all his intercourse with them was as kind as though they had done him no injury. There are many who can never forget his gentle and generous conduct toward

Freedom from resentment.

those who refused to recognize him as a Christian brother. In business, in social intercourse, and in fact everywhere, he was most careful to let his life "express the holy gospel we profess."

When spoken to by friends in regard to an uncharitable spirit which had been manifested toward him, he quietly replied: "I can only do my duty. It remains with them to decide what their course shall be."

Seeing his conduct under such trying circumstances, one of his acquaintances remarked: "That man witnesses more of the spirit of Christ than I ever saw in any one else."

Conversion of an employee.

Diffident and retiring as he was, Mr. Chapin sought opportunities for religious conversation, both for the sake of edification and in order to do good. In 1861 a Frenchman was employed as an engineer at the Massasoit House. Finding him more than ordinarily intelligent, Mr. Chapin took the opportunity at odd moments of conversing with him. Learning that he was a Republican, they conversed freely on political subjects, on which they perfectly agreed. Frequently religious topics were also discussed. Mr. Chapin soon saw that the man, although a Roman Catholic, was open to conviction, and was already satisfied that much of the instruction which he had

received from the priests was erroneous. He therefore sought occasions for turning the man's attention to the Bible. He gave Scriptural proofs for all his statements and instruction, carefully explaining what seemed not to be understood. All this, and especially Mr. Chapin's simple, Christian life, soon bore fruit. The man took more and more interest in what he was learning from his kind employer, down in the hot engine-room, and finally became an earnest Christian. From that time on, the two spent many hours in planning for a French Protestant Church in Springfield, a hope which was finally realized in 1880, — one of them becoming a constant, liberal, and sympathetic helper till the day of his death, and the other a pillar in that promising enterprise.

For a long time previous to his death Mr. Chapin understood that he was suffering from an incurable disease, and that there was no hope for his recovery. This knowledge naturally cast something of a shadow upon the last days of his life, but it neither soured his spirit nor abated his interest in what was going on around him. It made him even more thoughtful, and he took increasing pleasure in spiritual things.

On the 30th of March, 1888, his pastor, the

Rev. Dr. Eustis, died. It was he who had received Mr. Chapin to church membership twenty-three years before, and who had been his honored and beloved guide in spiritual things during all that period. Ten months later his lifelong friend and family physician, Dr. W. G. Breck, was also suddenly called away. In both instances the sad news was communicated to Mr. Chapin with a good deal of anxiety. He received it, however, with much less emotion than had been feared, but there is little doubt that these events hastened his death. The decease especially of Dr. Breck had come so very unexpectedly that we cannot wonder that it produced a shock from which Mr. Chapin never recovered.

Death of Dr. Eustis and of Dr. Breck.

All through the winter he greatly enjoyed listening to reading, a part of each afternoon being devoted to the reading of the Bible. Later the other books were all discarded, and the Bible was all that seemed to meet his need. As one traveling at night in a dark and unknown place carries a lantern to light up his pathway, so this thoughtful man, in the near prospect of death, took God's Word as the only thing which shed light midst the shadows of the dark valley.

Increasing love for the Bible.

"This lamp through all the tedious night
Of life shall guide our way,
Till we behold the clearer light
Of an eternal day."

He found great delight in the Prophecy of Isaiah, remarking when it was ended, "I never knew before how good it was." Having completed that book, he next chose the Psalms. On the 18th of February he listened to the reading of the first four Psalms. The closing verse of the last of these was: "I will both lay me down in peace, and sleep: for thou, Lord, only makest me dwell in safety." Soon after the reading was over he went upstairs never to come down again. Two days later he sat up in his room to take his tea for the last time. Just a week before he had taken a long drive, but on his return home felt very weak. His physician called to see him in the evening, and was shocked to notice what a change had come over his patient. About that time, while talking with the doctor, he said: "Dr. Breck, I know I cannot live much longer. I am ready to go. I have been ready to go for a long time. All I wish you to do is to make me as comfortable as you can."

Goes upstairs for the last time.

Previous to his illness Mr. Chapin had settled

all his affairs with characteristic care and thoroughness. After he was laid aside from active life he repeatedly explained his plans and wishes to his daughters, in order that there should be no misunderstanding, and that no one need suffer for anything which he had left undone.

Final business arrangements.

On Thursday, February 28, Mr. Chapin lay most of the time quietly and with his eyes closed. When spoken to, however, he answered intelligently those who addressed him. At midnight he affectionately bade each one "good-night," calling one after another by name. At six o'clock in the morning, when the window-shade was raised, and the light streamed in, he remarked: "It is a very fine morning; it is a very fine morning." Later, when the doctor came in, he distinctly and intelligently answered all his inquiries. His brother, Mr. Marvin Chapin, came in about ten o'clock. In answer to his question, "How do you feel this morning?" he replied, "I feel very well." An hour later he called to his wife, "Louisa, Louisa, Louisa!" At noon, when asked if he could swallow, he said: "No," which was the last effort that he made to speak. Although he once after this opened his eyes, and for an hour seemed to

Last hours and death.

recognize those who touched him, yet it was evident that his little remaining strength was fast passing away. There were no signs whatever of any suffering, and at half past three the spirit of the good man peacefully went home.

Mr. Chapin lived to a good old age, nearly five years beyond the Scriptural limit of "threescore years and ten," but he retained to the last all his mental powers. He was a strong, well-built man, of striking presence. Had it not been for the disease which undermined his constitution and took him away, he might still have been a moving spirit among us. His friends were spared many of the regrets at his death which are often felt when loved ones are called away.

Thoroughness.

Mr. Chapin had, in an unusual degree, done his work. He did not leave behind him a number of half-completed enterprises. Whatever he had begun he had also, to the best of his ability, brought to a successful completion. Like some of the beautiful specimens of his early workmanship, his life was a remarkably finished one. The defects of his life and character were mainly due to circumstances over which he had no control, but which he manfully struggled to over-

come. His virtues were numerous and great. Just, honorable, public-spirited, modest, kind, generous, and religious are some of the characteristics with which various friends love to associate his memory. Characteristics.

He was not famous, but he did his part well, during a long and active life, and exerted, even upon strangers, an influence which will bear fruit when many names of world-wide repute shall have been forever forgotten.

The following lines, written of one of the greatest of men, are eminently appropriate to the life and character of Mr. Ethan S. Chapin: —

"Great is he who, in some special location, as a soldier, a governor, a scientist, does good and helpful work for fellow-men. Greater still is he who, doing good work in his special occupation, carries with his devotion to it a human nature so rich and true that it breaks through his profession and claims the love and honor of his fellow-men, simply and purely as a man." Mr. Chapin deserves our love and admiration chiefly as a noble, Christian man.

"The splendors of the firmament of time
May be eclipsed, but are extinguished not;
Like stars to their appointed height they climb,
And death is a low mist which cannot blot
The brightness it may veil."

The funeral.

Mr. Chapin's funeral, on the afternoon of Monday, March 4, was a simple and appropriate service. The following account was given in the next morning's edition of the "Springfield Republican:" "There was a large attendance, and the services, though simple, were impressive. Four ministers took part in the exercises, Rev. Dr. Buckingham, who had known Mr. Chapin during most of his long residence here, Rev. M. C. Stebbins, of Cornwall, Vt., Rev. Dr. Burnham, and Rev. Mr. Trask. Some very beautiful flowers were sent to the house, including a wreath of ivy, with English violets, from Mrs. W. G. Breck; a spray of camellia with green from Adolph Milliez; a sheaf of wheat from Mrs. H. B. Burt; a wreath of ivy from Mrs. William Birnie and others. The casket was festooned with ivy, and lilies and roses were placed around the room. A quartette, composed of George R. Bond, Henry F. Trask, Henry G. Chapin, and Edward Morris, sang 'There is a Land Immortal,' after which Rev. Mr. Trask read selections from the Scriptures. Mr. Stebbins said that he appreciated very highly the honor conferred upon him by being asked to say a few words in memory of his dead friend. Not that it needed mere

Mr. Stebbins's remarks.

words to add to the dignity and sweetness of such a nature as that of Ethan S. Chapin, because his works lived after him. Long after the massive buildings that now adorn the streets of Springfield shall have crumbled away, the influence of the deceased will be remembered, and his memory kept green. Mr. Chapin's life was a very busy one, and when his brain was busiest at all those wonderful schemes that seemed so incredible years ago, we know that he was only living some twenty years before his time. In our day his early scientific schemes and plans would have been more appreciated. His home life was pure and happy, and his was always the ready hand willing to help others. How much do many young men, who set out long ago in life, owe to Mr. Chapin! He was their benefactor and friend, and trained the young people around him so faithfully that his ideas and influence have aided largely in the shaping of their characters and lives. Mr. Stebbins referred to Mr. Chapin's life as being the embodiment of a Christian life, and pointed out the many lessons to be learned from it. In business, he was fair and honorable, and his word was his bond. 'Blessed are the dead that die in the Lord.' Mr. Stebbins then made a feeling ref-

erence to the many charitable acts of the deceased, to his acts of mercy, and spoke on his varied gifts that had done so much for himself and for those around him. Would that more lives, he said, in closing, were like that of the good man they now so sincerely mourned. After the singing of 'Paradise,' by the quartette, Dr. Buckingham spoke briefly, as follows: —

Dr. Buckingham's address.

"When abroad in Paris, some years ago I met a friend who gave me this advice: 'There are certain things you cannot do here. You cannot die here.' She meant that it was a terrible thing to die abroad. I thought then if I were in a railroad accident and had to be taken to a hotel, how much would I prefer that I might be carried to the Massasoit House. Mr. Chapin was a Good Samaritan, and strangers were as safe with him as if they had been with their own families. I am reminded, too, of one that went about the old Massasoit House like an angel of mercy, Miss Roxana Chapin. Dr. Seelye told me that he believed that she was the best Christian in Springfield, and I had met her too often at sick-beds and at scenes of misery to deny it. We are not pagan in our ideas, and we know that there is an immortal life before us, and surely so many would not rush into suicide if

they knew that there was a life to come. This life is only a preparation, a foretaste of the joys of heaven. Such a life and hope was that of our friend, and he only sleeps to wake again. We cheer our sad hearts when we part from these dead friends, because we hope to meet them again. I am certain that I shall know Ethan S. Chapin, for I only know one other life like his. What will he not know, and what will he not enjoy? I know he will enjoy heaven just as well as he ever did being here, and perhaps better, for he will be found ministering to others in that far-away land, not ministering to the sorrowing, for there is no sorrow there, but as a ministering angel. Let him sleep on, then, for we part with him only, I hope, to meet him again.

"'Gathering Home' was then sung, and the services closed with prayer by Rev. Dr. Burnham. The bearers were D. B. Wesson, Frederick H. Harris, H. A. Gould, O. H. Greenleaf, W. K. Baker, and J. N. Dunham, and the remains were placed in the receiving vault in the Springfield Cemetery."

MR. CHAPIN'S SCIENTIFIC VIEWS.

MANY of Mr. Chapin's ideas were both new and startling. If they are true, it is of the greatest importance that they be widely known.

It is hoped that the foregoing sketch of his life, with the following notices of the chief points in his theories, may be helpful in calling attention to the importance of his work.

Even those who never knew him will join in the wish that Mr. Chapin may receive full credit for the service which, under unusual difficulties, he has rendered to the world in the line of scientific scholarship.

The three most important topics treated in Mr. Chapin's books, and those which he discussed with the greatest originality, are "Gravitation," "The Physical Condition of Jupiter," and "The Instability of the Earth's Axis." Mr. Chapin took the very advanced ground that *gravitation determines the density, the temperature, and the fluid or solid condition of matter.* "Heat and gravity are correlative." When "gravity is resisted, heat

becomes its equivalent." With these data it was comparatively easy for him to prove that the earth consists of a densely heated molten nucleus, surrounded by a thin crust of uniform thickness.

For the past forty years the leading geologists, such as Sir Charles Lyell and Sir William Thomson, have generally held that the earth is a solid body. Only very recently has the tide of opinion begun to turn in the direction of the theory, held so strenuously by Mr. Chapin, that the centre of the earth must be a molten mass of such density that the surface, as it cooled, could not sink. The experiments used by Mr. Osmond Fisher, Mr. Alfred Russel Wallace, and others, to prove this idea are just such as Mr. Chapin described when he fearlessly advanced his views. It is found to be a universal phenomenon that there is an increase of heat as we descend below the surface of the earth. This increase has been computed to be about 1° Fahrenheit for each sixty feet of descent. There is, however, some variation according to the locality, and the rate of increase has been found to be greater as the depth increases. Basing his estimate on these phenomena, which, of course, are very meagre, Mr. Wallace favors the opinion that at a point

twenty miles below the surface of the earth the heat must be sufficient to melt rock.

While making use of known facts in regard to the increase of temperature as we descend below the earth's surface, Mr. Chapin based his theory of the condition of the earth's centre upon the law of gravity. He argued that the thickness of the earth's crust is determined almost entirely by the force of gravity acting upon matter in a body of the size and form of the earth.

The same force acting upon Jupiter, a body with a volume more than twelve hundred times as great as the earth, develops a much larger and an intensely hot nucleus, but a much thinner and denser crust. If the thickness of the crust of the earth, as Mr. Chapin was inclined to believe, is about fourteen miles, then the crust of Jupiter, he estimated, cannot be more than two miles thick, while that of our own moon, a comparatively insignificant body, must be eighty-four miles thick. These conclusions are quite at variance with the old theory that the distant planets are intensely cold bodies, and also, to some extent, with the recent view, which considers that Jupiter is more like the sun than like the earth, being partially, at least, self-luminous, and having no crust. This

last theory has been reached by mathematical deductions, and was invented to account for the condition of things on that planet which the telescope and other astronomical instruments have made known in recent years. When Professor Peirce, of Harvard, and Dr. Henry Draper first adopted this theory, Mr. Chapin greatly rejoiced, feeling that these eminent scholars had come to accept, at least in part, views which he had published many years before.

Until very recently, it had always been supposed that the axis of the earth, while the planet makes its daily revolutions, and flies along its orbit around the sun, remained perfectly stable. No one seemed to even consider the possibility of anything different.

Mr. Chapin, advanced the very novel theory that the earth's "axis of rotation does not pass through the centre of the earth," and that "the retrograde motion of the moon, when compared with the rotation of the earth on its axis, causes an *instability of the earth's axis*, and gives an eccentric motion to the earth."

This discovery was made by Mr. Chapin while studying up the vexed subject of tides. He had long felt, as many other scholars before him had felt, that the commonly received expla-

nation of the phenomena of tides was very unsatisfactory. He set to work in his quiet and thorough way to study the relations of the earth and its satellite, and of their various movements. In this connection he noticed for the first time that the axis upon which the earth rotates is unstable. This idea, although very differently applied, is now accepted by the leading scholars of the day.

It yet remains to be seen, however, whether the theory will prove to be of great and practical value, as Mr. Chapin confidently predicted that it would.

Mr. Chapin's theory of the instability of the earth's axis, and the consequent eccentric motion of our planet, received a few years ago an interesting confirmation from an unexpected quarter.

Professor Newcomb, of the Naval Observatory, Washington, has long been studying the very difficult problem of celestial mechanics. In the course of his investigations of the moon's motion, he arrived at the conclusion that there were certain differences between theory and observation which had not yet been accounted for by the gravitation of known bodies of the solar system. Professor Newcomb suggested that there were but three possible solutions of

this discrepancy: "1. The mathematical analysis was not sufficiently extended; 2. The motion of the moon was affected by some force different from gravitation; 3. The time of the earth's rotation on its axis was not constant."

After careful study Professor Newcomb was able to demonstrate that the first and second of these hypotheses are improbable, and that we are, therefore, shut up to the third and somewhat startling explanation, that the earth's time of rotation on its axis is not strictly uniform.

Even scholars had supposed that the absolute uniformity of the sidereal day was not to be questioned. But Professor Newcomb's researches have proved that the rate of the earth's rotation for a number of years previous to 1860 had been slower than the average, and that there was a gain of at least a second per annum during the next twelve years. These facts account for the inequalities in the moon's motion which had previously been observed.

Various experiments have been tried by other astronomers for testing Professor Newcomb's hypothesis, with this important result, that it is now admitted, that "the earth's rotation time is not strictly constant."

Mr. Chapin's language on this subject is: "The retrograde motion of the moon, when compared with the rotation of the earth on its axis, causes an instability of the earth's axis and gives an eccentric motion to the earth."

In this connection, it is interesting to note that, at a meeting of the International Conference on degree measurement, held at Freiburg, Germany, in 1891, facts were brought forward to show that fluctuations of the earth's axis, probably due to changes in the internal mass of our planet, exist. Observations carried on simultaneously at Berlin, Strasburg, and Prague prove that a decrease in latitude, at least in middle Europe, has been in progress, and a similar phenomenon has been noted in other places in Europe.

All this indicated an alteration in the direction of the axis of the earth. That is, the poles and the equator, latitude and longitude, are not, as is commonly supposed, practically fixed data. The amount of ascertained decrease of latitude at the end of the six months' period, from August, 1889, to February, 1890, was half a second.

A young astronomer of Berlin, named Marcuse, who has been a careful observer of the changes of latitude in Germany, was sent to

the Sandwich Islands in the summer of 1891, to make observations with a view to determining whether the changes which have been observed in Europe are due to a real movement of the pole of the earth, or whether they are merely apparent, and due to some atmospheric effect. In the former case the latitude at the Hawaiian station ought to vary in just the opposite way from that of Berlin and Strasburg, but if the cause is atmospheric, there should be no such result.

Mr. Marcuse was accompanied by Mr. Preston of our own Coast Survey, who has made latitude observations, and has been studying the magnetic elements of the island.

The reports of this expedition, which have only very recently been received, have confirmed what was previously surmised. The Hawaiian station is on the opposite side of the globe from Berlin. Consequently the latitude, as had been expected, was found to vary in just the opposite way from that which had been observed at the stations in Central Europe. The theory of the instability of the earth's axis may now be regarded as an established fact of science.

On the publication of Mr. Chapin's first book the Rev. M. C. Stebbins, who was at that time

the Principal of the Springfield High School, and who was a thoughtful and intelligent man, wrote him the following letter: —

SPRINGFIELD, *July* 18, 1867.

MR. E. S. CHAPIN:

Dear Sir, — I have read with some care the work entitled "Gravity in Nature," for which I am under obligations to you. That the book is the product of much study and patient thought is evident. Few men are actuated by a devotion to science loyal enough to carry them through the toil necessary to bring out such a work, and especially under the circumstances in which you have labored.

But while I admire the scholarly enthusiasm that the work evinces, I am unable to accept all of its premises and conclusions. Even if it were true that an isolated column of solid matter could not be sustained by its own base beyond a given height, because the pressure would develop heat sufficient to liquefy the solid, I cannot conceive that the same results would follow when the column has become a constituent part of the solid crust of the earth. Results are here greatly modified by two important laws. First, the arrangement of matter in the form of a hollow sphere would tend not

only to give the parts ability to sustain each the weight of the other, but to give the whole structure the greatest power of resistance.

Secondly, the force of gravity diminishes directly as the distance diminishes as we pass from the surface to the centre of the earth.

Must we not then look for some other cause for the fluidity of the nucleus of the earth? Quite a number of your conclusions seem connected more or less intimately with these premises.

I am not sure that I fully comprehend the entire astronomical argument. A few minor errors of statement you would at once recognize, were your attention called to them. Some of the themes which you have treated are so abstruse in their nature, and are so imperfectly cognizable by the senses, that there is large opportunity for difference of opinion among thinking men.

That you may continue to find satisfaction in the study of such grand themes of science, is the sincere wish of

Yours truly,

M. C. Stebbins.

It is very interesting to know that, after further careful study, Mr. Stebbins became

such a thorough and ardent convert to Mr. Chapin's theories that, twenty years later, he aided in the publication of Mr. Chapin's last book, all of whose principles he then believed, and which he regarded as a substantial contribution to the cause of science.

After having read Mr. Chapin's first book on gravity, Professor Joseph Henry wrote to him as follows : —

SMITHSONIAN INSTITUTION,
WASHINGTON, *June* 20, 1867.

ETHAN S. CHAPIN, ESQ., Springfield, Mass.:

Dear Sir, — I write to thank you for a copy of your work on "The Correlation and Conservation of Gravitation and Heat," as a present, I presume, to the Library of the Smithsonian Institution, and to assure you that it will be carefully preserved with the books of the Government, now under charge of the Library of Congress.

The study of this subject has, doubtless, been a source of much rational gratification to you, and although many of your propositions may be disputed, I have no doubt you have sought to arrive at truth. My own views in regard to gravitation and heat, from all the phenomena with which I am acquainted, lead

me to conclude that they are not convertible into each other, though in mechanical energy they may be expressed in dynamic equivalents. Gravitation is an example of what in science has been denominated pure force, acting instantaneously at the greatest distance, while the phenomena of heat are best generalized by reference to molecular vibration.

If the sun were instantly annihilated, the planet Neptune would, at the same moment, commence moving in a tangent to its present orbit, while the last ray of heat from the central body would require several days before its effects would be perceptible at the distance of the planet.

Yours very respectfully,

JOSEPH HENRY.

During the past twenty-five years, as scholars have studied the subjects treated in Mr. Chapin's books, there has been an increasing tendency to accept rather than to refute the views advanced in those books. From time to time unsought testimony has come in from various sources, which has been most gratifying to those who believe in the soundness of Mr. Chapin's scientific ideas.

The following paragraph appeared in the

Springfield "Republican" for December 30, 1872, and in the New Haven "Palladium" two days later: —

"Mr. E. S. Chapin of this city published, several years ago, a philosophic little book, entitled 'Gravity in Nature,' which, among other bold and novel theories, advanced the idea that the planet Jupiter, instead of being uninhabitably cold, was exceedingly hot. The savants rather sneered at the revolutionary proposition when it was made, but the whirligig of time, along with its other revenges, is bringing them around to the same point, and in the last number of the 'Scientific American,' in the course of an article upon the modern spectroscope, photometer, and telescope, it is concluded that 'Jupiter shines partially by his own light, is, in fact, red-hot, and is surrounded by vapors,' — which is a cause of gratification to our scientific townsman."

The following is a part of an article, giving a sketch of Mr. Chapin's life, which appeared under the heading, "Self-made Men," in the "Chimney Corner" for November 7, 1874: —

"The love of his leisure hours has been the study of various branches of the sciences. In 1867 he published a small work, entitled 'The Correlation and Conservation of Gravita-

tion and Heat, and Some of the Effects of these Forces on the Solar System,' which has attracted no little attention among learned men. His views show deep and original investigation and thought, and some which were disputed when first put forth have more recently received the concurrence of eminent astronomers. Mr. Chapin is certainly an enthusiast in this field of investigation, which he has pursued without the ordinary course of study and guides which are enjoyed by professional men, but with results which are a high tribute to his powers of mind and talent for scientific research. During a visit of the writer to the residence of Mr. Chapin, he gave some explanations of his investigations, which impressed us that, though only claiming to be an amateur in them, he had gone deeper than many who lay claim to great names in science.

"From these facts, it will be seen that Mr. Chapin is decidedly a remarkable man. Thrown upon the cold world to gain his own livelihood at an extremely early age, he bravely commenced the struggle which has resulted in his securing an honorable fortune.

"Practical and shrewd in all business operations, he has exerted an influence second to none of his contemporaries. But he has also

found the time and inclination for intellectual investigations of a nature which it is a rare thing for any person in the mere business walks to attempt."

Soon after the publication of "Gravitation the Determining Force," the following article appeared in the Springfield "Daily Union:" —

"Springfield may well indulge some measure of local pride in view of the fact that one of the busiest of her business men has found time and inclination to observe, experiment, and follow out, by processes of shrewd and logical reasoning, to a clear solution, some of the more abstruse problems, astronomical and terrestrial. During the years when Mr. Ethan S. Chapin, as one of the proprietors of the Massasoit House, was doing his share to give it national reputation as a first-class hotel, he found time to study the working of the forces of nature. More than twenty-five years since, Mr. Chapin became satisfied that the influence of gravitation determines the form, motions, internal and superficial condition of all the bodies that move in space. From the fact that a vertical column of matter is more and more dense the farther you recede from the vertex, and that an increase of density caused by gravitation occasions an increase of temperature, and this

lessens the force of cohesion, it becomes an inevitable inference that by descending toward the earth's centre a limit will be reached beyond which every solid substance will be fused. The greater the mass of the sun or planet, the stronger is the force of gravity upon or near its surface, and consequently the nearer its surface the fluid line will be. Following out this reasoning Mr. Chapin concludes that the body of the sun is fluid and intensely hot; that the 'melted nucleus of Jupiter must be comparatively large, its crust dense and thin, with a great conducting power that keeps the surface at a high temperature.' It is worthy of note that Mr. Chapin put forth these views in his little book, 'Gravity in Nature.' . . . How much in advance of the scientists Mr. Chapin was is indicated by this quotation from 'The Annual Cyclopedia for 1880:' 'Among the papers read at a meeting of the Royal Astronomical Society on May 14, 1880, was one of great value by Dr. Henry Draper, of New York. The facts now obtained by spectroscopic investigation seem clearly to indicate, as Dr. Draper remarks, that Jupiter is still hot enough to give out light, though perhaps only in a periodic or eruptive manner.'

"Some conclusions recorded by Mr. Chapin

have a special interest because of the striking confirmation they have received by the recent commotions along the Atlantic coast. Mr. Chapin, in speaking of the earth's crust, says: 'Making due allowance for modifying causes, it seems probable that it is less than fourteen miles in thickness.' Again: 'Earthquakes occur most frequently where the disturbing forces are the most intense and act the most in unison, as when the earth is in that part of her orbit nearest the sun, and the moon is at her least distance from the earth, or when the sun and moon are in the same line with the earth, and a high tide in consequence rests on the area about to be depressed. . . . As the sun passes the equator twice every year (March 21 and September 21), and the tides are the highest when the sun is in that vicinity, earthquakes are frequent when the sun is near the equinox.' Mr. Chapin might well be interested in the following item which he cut from a paper a few days since and forwarded to Mr. Stebbins: 'The moon was in perigee at 2 A. M., August 29; new moon at 8 A. M., the same day, acting in a direct line with the sun (the eclipse of the sun occurred at 5 A. M.); extremely high tides therefore occurred for several days following. The moon's upper transit at Charleston

occurred at 2.22 P. M., August 31. The high tide following was at 9.35 P. M., twenty minutes before the shock occurred.'

"Mr. Chapin has consequently had the best possible indorsement and verification of his conclusions in their subsequent acceptance by scientific men and in the processes of nature itself, and we congratulate our townsman heartily upon his now recognized and confirmed scientific deductions."

At the time of Mr. Chapin's death there was a long article in the same paper from which we quote : —

"The scientific side of Mr. Chapin's life and mental endowment was really remarkable, and had he made scientific study his work rather than his recreation and diversion he would have ranked among the very highest authorities in the scientific world. Indeed he lived to see many of his views formally indorsed by prominent scientific men years after he had adopted them, and amid the incessant and distracting cares of a busy life he wrought out by processes of shrewd and logical reasoning some of the more abstruse astronomical and terrestrial problems.

"The extraordinary commotions along the Atlantic coast in the late summer of 1886, cul-

minating in the Charleston, S. C., earthquake, were in direct confirmation of Mr. Chapin's conclusions, and it is a source of pride and satisfaction to Mr. Chapin's townsmen that he reached, seemingly almost by intuition, results which have now become part and parcel of accepted scientific knowledge."

On the same day the Springfield "Republican" also printed an interesting sketch of Mr. Chapin's life. Speaking of his scientific and literary tastes, it says : —

"In spite of the duties of hotel management, which keep a man on the jump from basement to the top floor, conversant with every detail of kitchen, dining-room, and sleeping-rooms, Mr. Chapin found time to study physics and astronomy, and to evolve a theory which had haunted his mind for some time, that gravity is the determining force in all natural phenomena. In 1864 he published his idea in a pamphlet, entitled 'Gravity and Heat,' and three years later, with the assistance of his daughter, Mrs. Haile, expanded the theory into a book of one hundred and twenty pages, printed by Samuel Bowles & Co., and given to the trade by Lewis J. Powers & Bros. The title of the volume was, 'The Correlation and Conservation of Gravitation and Heat, and Some

of the Effects of These Forces on the Solar System.' In his preface he acknowledges that his deductions are contrary to accepted theories, but he is content to wait long, if necessary, for an impartial reader. Twenty years later, in 1887, he gave to students another volume of one hundred and sixty-nine pages, from the Riverside Press of Cambridge, to which he gave the simple title, ' Gravitation the Determining Force.' In the brief preface he recalls his former publications, and notes with pride that several scientists, by independent research and experiment, have reached conclusions substantially in accord with the principles and theories which he laid down twenty years before."

The following very appreciative article appeared in the Springfield " Republican " of May 10, 1891, under the head of " Popular Science Gleanings : " —

" The theories in physical science of our late townsman, Ethan S. Chapin, appear to have been reiterated in an important particular at the International Conference on degree measurement, held some months since at Freiburg. Much was said at this conference of the fluctuation of the earth's axis, probably due, it was explained, to the changes in the internal mass of our planet. In his book entitled ' Gravita-

tion the Determining Force,' published some years since, Mr. Chapin seems to have anticipated to a considerable extent the professional astronomers in this matter. Much space in this work is devoted to demonstrating, contrary to the generally received opinion of the time, the instability of the earth's axis. As Mr. Chapin's reasoning is accompanied by copious reference to illustrative figures, it will be difficult to do it justice in a newspaper paragraph. It is sufficient, perhaps, to say that he attributes this axial instability to the influence of the moon and sun. These extracts from the book in question give an inkling of the line of argument pursued: —

"'The line in the earth that has the least motion, I shall designate as the axis of rotation. That line does not pass through the true centre of the earth, but at a little remove from it. As its angular position from a line joining the moon and the centre of the earth remains invariable, the retrograde motion of the moon, when compared with the rotation of the earth on its axis, causes an instability of the earth's axis, and gives an eccentric motion to the earth.'

"'The influence of the moon on the earth causes the axis of rotation to be removed from

the geometrical centre of the earth, giving the latter an eccentric motion. The retrograde motion of the moon, when taken in connection with the diurnal rotation of the earth, causes the earth's axis to be unstable, as it is continually dropping back to meet the moon. While the earth's centre comes up at the end of the yearly revolution to the line from which it started, the surface lags behind, in consequence of the eccentric motion caused by the instability of the earth's axis.'

" ' When the sun and planets act in conjunction with the moon, or when the distances between them and the earth are diminished, the axis of the earth deviates more from the true centre, and the eccentricity is increased; so, also, when the sun and planets act in opposition to the moon, or the distances between them and the earth are increased, the displacement of the axis of rotation and the consequent eccentricity are proportionately lessened.' "

Mr. Chapin sent copies of his last book, as soon as it was published, to a number of leading scholars in various parts of the country. Of the letters received in reply, those from President Hill, of Harvard College, President Chapin, of Beloit College, and from Mr. C. I.

Walker, of Charleston, S. C., will be read with interest: —

PORTLAND, *November* 25, 1887.

MR. E. S. CHAPIN:

My dear Sir, — I have read your little volume on Gravitation with a great deal of interest. It presents many points of physics in a very clear light, and suggests several new and valuable ways of looking at sundry points.

Of course, you cannot expect that I should agree with all you say. Take, for example, glaciation. While it is true that very many of the phenomena can be perfectly explained, as you say, without supposing greater areas of glaciers than the present, and while I agree strongly with you, as to the fallacy of "geological horizons," yet there are some phenomena that seem to me to point unmistakably to extensive glacial epochs.

Again, in regard to the tides, to the acceleration of the moon's orbit, to the precession of the equinoxes, and other astronomical points, your condemnation of certain views, and establishment of different positions, remind me of what an old (eighty years) clergyman said to me recently, about theological discussions: "We all are trying to say the same thing," said

he, "but neither understands what the other means."

The best mathematicians frequently translate their mathematics very poorly into common language. Translate their mathematics more accurately into common speech, and it would frequently agree much more closely with your views. Or put your views into mathematical terms, and they would come to very similar mathematical formulæ to theirs.

There is one point which I have long thought that the mathematical astronomers neglected, and I am glad to find that you have thought so too, the question, namely, whether the sun's proper motion, in other words the motion of the solar system among the stars, has or has not any perceptible effect on the movements in the system itself.

Langley's volometer, and his boiling of water by unconcentrated sunlight on the top of a non-thawing glacier, are very wonderful additions to the data for speculations on these higher subjects.

Yours respectfully,

THOMAS HILL.

CHARLESTON, S. C., *October* 28, 1887.

MR. E. S. CHAPIN:

My dear Sir, — I am just in receipt of a copy of your book, "Gravitation the Determining Force," and beg to return my thanks for your very flattering remembrance. I shall read it with great pleasure, and, I am sure, with equal profit. The practical experience I have had in seismic disturbances creates considerable interest in the subject for me.

Again thanking you, I remain,

Yours truly,

C. I. WALKER.

BELOIT COLLEGE,
BELOIT, WIS., *December* 5, 1887.

ETHAN S. CHAPIN, ESQ.:

Dear Sir, — I beg you to accept my thanks for your book, entitled "Gravitation the Determining Force," which came to-day. I gave a little leisure this afternoon to its examination, with interest. Its discussions run on a line outside the range of my special studies. I do not feel competent to judge of the merits of the argument, but I am much pleased with its style, so terse and clear and of pure English, with the evidence it gives of thoughtful and original scientific study, and with the harmonizing of its

conclusions with the Biblical records of the Creation.

I wonder that amid your absorbing business occupations you have found time and vigor for such profound investigations. It honors the Chapin name.

I am sorry that I had not the pleasure of meeting you at the recent setting up of the statue to our honored progenitor.

I am glad to see that we both belong to the seventh generation, and come down from Dea. Samuel through his son Japhet.

Gratefully yours,

A. L. CHAPIN.

Mr. Chapin was a reverent man. His studies were conducted in a Christian spirit. He found that his love for the Bible put no constraint upon him in his scientific investigations, nor did the conclusions to which these investigations led oblige him to alter his estimation of the Word of God. It might have been supposed that the fearless and independent character of his methods, and the originality of his views, would lead him into eccentricities of religious opinion, but such was not the case. His studies, instead of undermining, strengthened his faith in God and his confidence in

the Bible. "The more spiritual is a man's religion, the more expansive and broad it always is." The closing paragraphs of his last work are the thoughtful and worthy words of a Christian scholar.

"As the density of matter depends upon the conditions determined by the force of gravitation, matter must have existed prior to its condensation, in a gaseous or nebulous form. I believe that this view of the primitive condition of matter harmonizes with the account of creation given by Moses in the Book of Genesis. From that we learn that the heavens and the earth had a material beginning. As in the first chapter of St. John we are told of the spiritual beginning, or the entrance of the Spirit into the world, Moses tells us that the matter of which the earth is composed 'was without form,' indicating that it was a very rare fluid, to us 'a void,' and that darkness was upon the deep, or abyss of celestial space, until the 'Spirit of God moved (by the agency of gravitation) upon the face of the waters,' or fluids, to condense them. 'And there was light;' when the surface of the earth became refrigerated and dark, 'God divided the light from the darkness,' but the length of time intervening is not specified. 'And God called

the light day, and the darkness he called night. And the evening and the morning were the first day,' or period.

"It is well to note the words of St. Peter: 'But, beloved, be not ignorant of this one thing, that one day is with the Lord as a thousand years, and a thousand years as one day.' It was necessary that the fluid, or 'waters which were under the firmament,' should be divided from the 'waters which were above the firmament' in the formation of the solar system from nebulous matter. After the waters were thus divided, and the planets formed, 'God called the firmament,' or celestial space, 'heaven.'

The primitive condensation would cause a high temperature. The waters were held in suspense until the surface refrigeration formed mountains and valleys as we are told: 'There went up a mist from the earth and watered the whole face of the ground.' When the surface temperature became sufficiently reduced to allow the suspended fluids to be condensed, 'the waters under the heavens were gathered together into one place,' the depressed portions of the earth, 'and the dry land appeared.' When the overhanging mist became condensed, 'the lights were set,' or became visible, 'in

the firmament of the heavens, to give light upon the earth.' The first verse of the first chapter of Genesis, in an introductory way, speaks of the creation of the heavens and the earth. The second, third, fourth, and fifth verses speak more particularly of the creation of the earth. The sixth, seventh, and eighth relate to the creation of the solar system. The ninth to the thirteenth inclusive speak still further of the creation of the earth. The fourteenth to the eighteenth inclusive tell us of the earth and the appearance of the solar system, after the surrounding mist, or waters, had been gathered together in one place. The last cited verses determine the division of time into seasons and days and years as we have them now, except that the length of the day has decreased by a very small fraction, since the fourth day, or period, of creation, by the refrigeration or very slight contraction, of the earth which took place in the early period.

"We are, therefore, led by revelation, as well as by science, to believe that the matter of which the earth and planets were formed originally pervaded space in a homogeneous nebulous form. If the density of the solar system were estimated in accordance with this theory, a cubic mile of such matter, it is said, would

weigh less than a cubic inch of our atmosphere, and space thus occupied might well be called a 'void.'

"When the matter of the solar system was in a nebulous form, and the force which caused particle to attract particle was imparted to it, the planetary system, following nature's laws, took its form fitted for life.

"If the force of gravitation should be removed from the solar system, many prophecies in Holy Writ would be fulfilled. The sun would 'become black,' owing to expansion; but the moon and the earth would be melted and 'become as blood;' 'and the stars,' or planets, by expansion, 'would fall unto the earth, and the heavens depart as a scroll when it is rolled together.' Rev. vi. 12–14; Isaiah xxxiv. 4.

"Independent of translating forces, the expansion of matter in so many conflicting directions might tend to restore comparative rest.

"Again, if we look out into the starry heavens, the probability that the earth is to be burned up is confirmed. Astronomers have computed that more than fifteen hundred fixed stars have disappeared within the last three centuries. Some of these stars may have become dark and invisible by surface refrigeration, as is the case

with the earth. Others have given the most indisputable evidence of having been consumed. Their light has broken forth with such splendor that they could be seen by the naked eye, at noonday, and at night through a canopy of clouds. After the conflagration had been visible for a few months, the stars disappeared.

"May the Creator of the universe grant that we may be prepared for that hour, when our works shall be tried by fire."

In these days of scientific and theological ferment the old landmarks are rapidly being removed. While fearlessly accepting truth, even when it seems to be in conflict with cherished opinions, we need not make haste to receive ideas still under discussion, however ardently they may be championed. Of one thing, however, we may be fully confident, that nothing can deprive us of those great and abiding spiritual verities which Christian experience and Revelation have made the common heritage of the world.

"The Christian scholar can well afford to be patient, knowing that we have all eternity to learn God in; it would be a poor prospect if we could get very far in our lesson here. We must expect to be puzzled and baffled again

and again; only do not let us get impatient, and weary of the search, or feel tempted to think that He is nowhere because we cannot yet reach to the height of His vision."